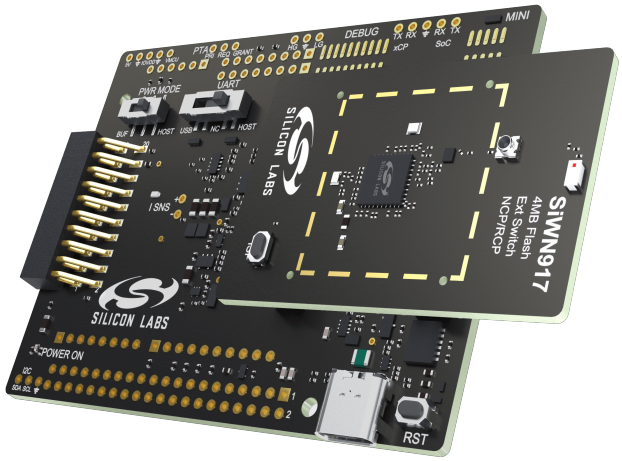
UG570: SiWx917 Wi-Fi 6 and Bluetooth LE 4 MB Flash Co-Processor Radio Board User's Guide

The SiWx917 Network Co-Processor (NCP) and Radio Co-Processor (RCP) Board (BRD4346A) can be best explored through a EXP Adapter Board for Co-Processor Expansion Kit or a Shield Adapter Board for Co-Processor Expansion Kit.

The EXP Adapter Board for Co-Processor Expansion Kit (Si-EB8045A) includes compatible connectors that supports SPI and SDIO to connect to Silicon Labs EFR32/EFM32 hosts. It also includes an EXP-to-SD Card accessory board to extend compatibility with 3rd party MCU or MPU host platform's SDIO connection.

The Shield Adapter Board for Co-Processor Expansion Kit (Si-EB8045C) features an Arduino Uno compatible connector that supports SPI to connect with some of the most popular open-source platforms like Arduino or other 3rd party MCU or MPU host platforms with that interface.



BRD4346A RADIO BOARD FEATURES

- SiWN917 Wireless NCP with 4 MB Flash (SiWN917M100LGTBA)
- Chip Antenna (2.4 GHz band)
- ISP Button for In-Serial Programming
- Co-axial Connector
- Optional Shield

SOFTWARE SUPPORT

- Simplicity Studio
- Energy Profiler
- Network Analyzer

ORDERING INFORMATION

- SiWx917-RB4346A

Table of Contents

1. Introduction

The BRD4346 Radio Board comes along with the adapter board in the SiWx917 Wi-Fi 6 + Bluetooth LE 5.4 Expansion Kit. The BRD4346A Radio Board can only be plugged in to this adapter board, unlike other radio boards which can be plugged into any main-board. The BRD4346A Radio Board through the adapter board is interfaced to the external host boards like Silicon Labs EFR32 and EFM32 devices, and some of the most popular open-source platforms like Arduino and Raspberry Pi. The adapter board features several tools for easy evaluation and development of wireless applications.

Refer the document UG569: Adapter Board for Co-Processor Boards User's Guide.

1.1 Ordering Information

BRD4346A can be obtained as part of SiWx917-RB4346A.

Table 1.1. Ordering Information

Part Number	Description	Contents
SiWx917-RB4346A	SiWx917 Wi-Fi 6 and Bluetooth LE 4MB Flash Co-Processor Radio Board	1x BRD4346A SiWx917 Wi-Fi 6 and Bluetooth LE 4MB Flash Co-Processor Radio Board

1.2 Getting Started

Detailed instructions for how to get started can be found on the Silicon Labs web pages: https://docs.silabs.com/wiseconnect/latest/wiseconnect-getting-started/getting-started-with-ncp-mode-with-efr32.

2. Hardware Overview

2.1 Hardware Layout

The layout of the SiWx917 Wi-Fi 6 and Bluetooth LE 4 MB Flash Co-Processor Radio Board (BRD4346A) is shown below.

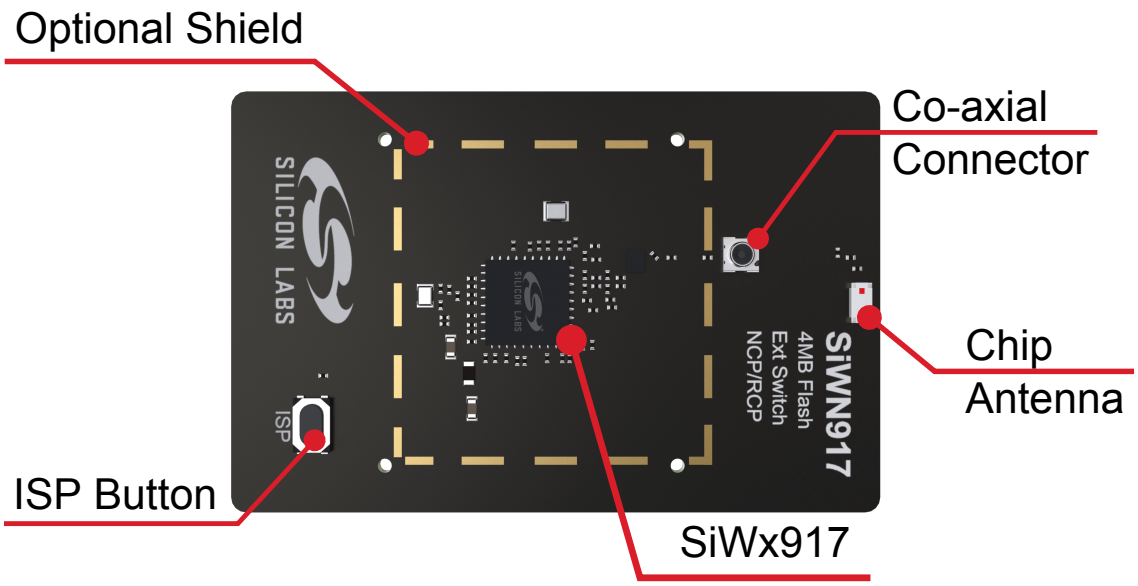


Figure 2.1. Hardware Layout of BRD4346A Radio Board

2.2 Block Diagram

An overview of the SiWx917 Wi-Fi 6 and Bluetooth LE 4 MB Flash Co-Processor Radio Board (BRD4346A) is shown in the figure below.

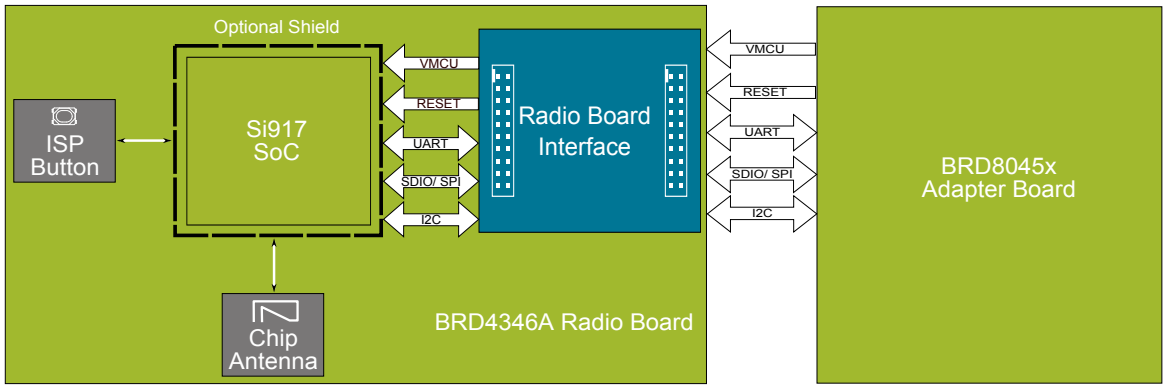


Figure 2.2. Radio Board Block Diagram

3. Connectors

The BRD4346A Radio Board can be interfaced to the different host boards through the connectors as available on the adapter board (BRD8045x). The three different kit variants with different adapter boards are designed to interface with different hosts in different ways.

Refer the document UG569: Adapter Board for Co-Processor Boards User's Guide to get an overview of the adapter board connectivity.

3.1 Radio Board Connector

The signals from the SiWN917 are routed to the corresponding peripherals and pins. The table below includes an overview of the adapter board connection with the SiWN917 Radio Board.

Table 3.1. Radio Board Pinout (P200)

Pin	BRD8045A Adapter Board Pinout	BRD8045B Adapter Board Pinout	BRD8045C Adapter Board Pinout	SiWN917 Pinout
1	3V3	3V3	3V3	Board controller supply
3	RADIO_P36	RADIO_P36	RADIO_P36	SDIO_CMD/SPI_CSN
5	NC	NC	NC	–
7	RADIO_P40	RADIO_P40	RADIO_P40	GPIO_52
9	RADIO_P42	RADIO_P42	RADIO_P42	GPIO_54
11	RADIO_P44	RADIO_P44	RADIO_P44	GPIO_56
13	RADIO_F0	RADIO_F0	RADIO_F0	JP2
15	RADIO_F2	RADIO_F2	RADIO_F2	JNC
17	RADIO_F4	RADIO_F4	RADIO_F4	POC_IN
19	RADIO_F6	RADIO_F6	RADIO_F6	ULP_GPIO_11
21	RADIO_F8	RADIO_F8	RADIO_F8	UART_RX
23	RADIO_F10	RADIO_F10	RADIO_F10	ULP_GPIO_2
25	RADIO_F12	RADIO_F12	RADIO_F12	UULP_VBAT_GPIO_2
27	RADIO_F14	RADIO_F14	RADIO_F14	UULP_VBAT_GPIO_0
29	RADIO_F16	RADIO_F16	RADIO_F16	ULP_GPIO_1
31	RADIO_F18	RADIO_F18	RADIO_F18	UULP_VBAT_GPIO_3
33	RADIO_F20	RADIO_F20	RADIO_F20	–
35	NC	NC	NC	–
37	5V	5V	5V	–
39	BOARD_ID_SCL	BOARD_ID_SCL	BOARD_ID_SCL	–
2	GND	GND	GND	–
4	RADIO_P37	RADIO_P37	RADIO_P37	UULP_VBAT_GPIO_1
6	NC	NC	NC	–
8	RADIO_P41	RADIO_P41	RADIO_P41	GPIO_53
10	RADIO_P43	RADIO_P43	RADIO_P43	GPIO_55
12	RADIO_P45	RADIO_P45	RADIO_P45	GPIO_57
14	RADIO_F1	RADIO_F1	RADIO_F1	JP0
16	RADIO_F3	RADIO_F3	RADIO_F3	JP1
18	NC	NC	NC	–
20	RADIO_F7	RADIO_F7	RADIO_F7	UART2_TX
22	RADIO_F9	RADIO_F9	RADIO_F9	UART1_TX

Pin	BRD8045A Adapter Board Pinout	BRD8045B Adapter Board Pinout	BRD8045C Adapter Board Pinout	SiWN917 Pinout
24	RADIO_F11	RADIO_F11	RADIO_F11	GPIO_10
26	RADIO_F13	RADIO_F13	RADIO_F13	GPIO_11
28	RADIO_F15	RADIO_F15	RADIO_F15	UULP_GPIO_8
30	RADIO_F17	RADIO_F17	RADIO_F17	ULP_GPIO_10
32	RADIO_F19	RADIO_F19	RADIO_F19	–
34	RADIO_F21	RADIO_F21	RADIO_F21	–
36	NC	NC	NC	–
38	GND	GND	GND	–
40	BOARD_ID_SDA	BOARD_ID_SDA	BOARD_ID_SDA	–

Table 3.2. Radio Board Pinout (P201)

Pin	BRD8045A Adapter Board Pinout	BRD8045B Adapter Board Pinout	BRD8045C Adapter Board Pinout	SiWN917 Pinout
1	GND	GND	GND	–
3	NC	NC	NC	–
5	RADIO_P2	RADIO_P2	RADIO_P2	–
7	RADIO_P4	RADIO_P4	RADIO_P4	–
9	NC	NC	NC	–
11	NC	NC	NC	–
13	RADIO_P10	RADIO_P10	RADIO_P10	–
15	RADIO_P12	RADIO_P12	RADIO_P12	ULP_GPIO_7
17	RADIO_P14	RADIO_P14	RADIO_P14	UULP_VBAT_GPIO_0
19	RADIO_P16	RADIO_P16	RADIO_P16	ULP_GPIO_1
21	RADIO_P18	RADIO_P18	RADIO_P18	UULP_VBAT_GPIO_3
23	RADIO_P20	RADIO_P20	RADIO_P20	GPIO_7
25	RADIO_P22	RADIO_P22	RADIO_P22	SDIO_IO_VDD
27	RADIO_P24	RADIO_P24	RADIO_P24	QSPI_CLK
29	RADIO_P26	RADIO_P26	RADIO_P26	QSPI_D0
31	RADIO_P28	RADIO_P28	RADIO_P28	QSPI_D1
33	RADIO_P30	RADIO_P30	RADIO_P30	QSPI_CS
35	RADIO_P32	RADIO_P32	RADIO_P32	QSPI_D2
37	RADIO_P34	RADIO_P34	RADIO_P34	QSPI_D3
39	GND	GND	GND	–
2	VMCU	VMCU	VMCU	–
4	RADIO_P1	RADIO_P1	RADIO_P1	–
6	RADIO_P3	RADIO_P3	RADIO_P3	–

Pin	BRD8045A Adapter Board Pinout	BRD8045B Adapter Board Pinout	BRD8045C Adapter Board Pinout	SiWN917 Pinout
8	RADIO_P5	RADIO_P5	RADIO_P5	–
10	RADIO_P7	RADIO_P7	RADIO_P7	–
12	NC	NC	NC	–
14	NC	NC	NC	–
16	RADIO_P13	RADIO_P13	RADIO_P13	ULP_GPIO_6
18	RADIO_P15	RADIO_P15	RADIO_P15	ULP_GPIO_8
20	RADIO_P17	RADIO_P17	RADIO_P17	ULP_GPIO_10
22	RADIO_P19	RADIO_P19	RADIO_P19	GPIO_6
24	RADIO_P21	RADIO_P21	RADIO_P21	GPIO_12
26	RADIO_P23	RADIO_P23	RADIO_P23	GPIO_15
28	RADIO_P25 (SiWx_SPI_EXP)	RADIO_P25 (SDIO_RPi/ SiWx_SPI_SHIELD)	RADIO_P25 (SiWx_SPI_SHIELD)	SDIO_CLK/SPI_CLK
30	RADIO_P27 (SiWx_SPI_EXP)	RADIO_P27 (SDIO_RPi/ SiWx_SPI_SHIELD)	RADIO_P27 (SiWx_SPI_SHIELD)	SDIO_CMD/SPI_CSN
32	RADIO_P29 (SiWx_SPI_EXP)	RADIO_P29 (SDIO_RPi/ SiWx_SPI_SHIELD)	RADIO_P29 (SiWx_SPI_SHIELD)	SDIO_D0/SPI_MOSI
34	RADIO_P31 (SiWx_SPI_EXP)	RADIO_P31 (SDIO_RPi/ SiWx_SPI_SHIELD)	RADIO_P31 (SiWx_SPI_SHIELD)	SDIO_D1/SPI_MISO
36	RADIO_P33 (SiWx_SPI_EXP)	RADIO_P33 (SDIO_RPi/ SiWx_SPI_SHIELD)	RADIO_P33 (SiWx_SPI_SHIELD)	SDIO_D2/SPI_INTR
38	RADIO_P35 (SiWx_SPI_EXP)	RADIO_P35 (SDIO_RPi/ SiWx_SPI_SHIELD)	RADIO_P35 (SiWx_SPI_SHIELD)	SDIO_D
40	NC	NC	NC	–

4. Kit Configuration and Upgrades

The kit configuration dialog in Simplicity Studio allows you to change the J-Link adapter debug mode, upgrade its firmware, and change other configuration settings. To download Simplicity Studio, go to silabs.com/simplicity.

In the main window of the Simplicity Studio's Launcher perspective, the debug mode and firmware version of the selected J-Link adapter are shown. Click the [**Change**] link next to any of these settings to open the kit configuration dialog.

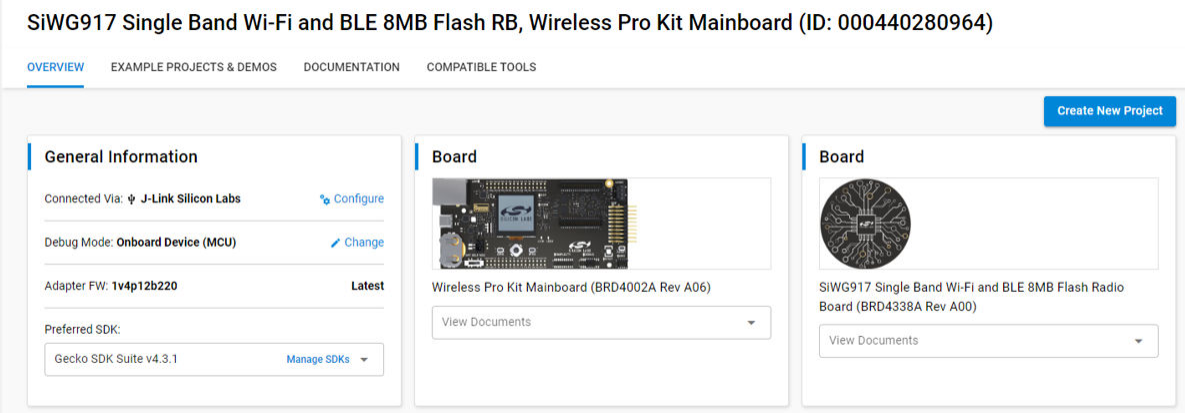


Figure 4.1. Simplicity Studio Kit Information

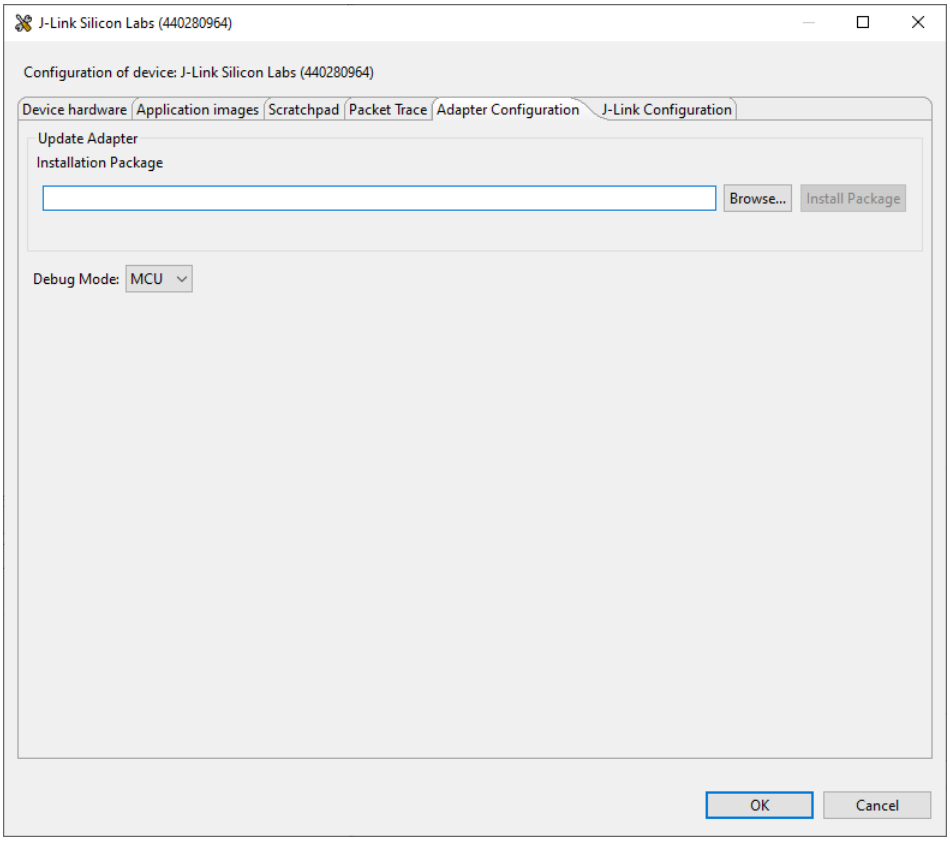


Figure 4.2. Kit Configuration Dialog

4.1 Firmware Upgrades

You can upgrade the kit firmware through Simplicity Studio. Simplicity Studio will automatically check for new updates on startup.

Detailed instructions to upgrade the SiWx91x Connectivity Firmware can be found on the Silicon Labs web pages: https://docs.silabs.com/wiseconnect/latest/wiseconnect-getting-started/getting-started-with-ncp-mode-with-efr32#upgrade-the-si-wx91x-connectivity-firmware.

5. Schematics, Assembly Drawings, and BOM

Schematics, assembly drawings, and Bill of Materials (BOM) are available through Simplicity Studio when the kit documentation package has been installed. They are also available from the kit page on the Silicon Labs website: silabs.com.

6. Kit Revision History

The kit revision can be found printed on the kit packaging label, as outlined in the figure below. The revision history given in this section may not list every kit revision. Revisions with minor changes may be omitted.

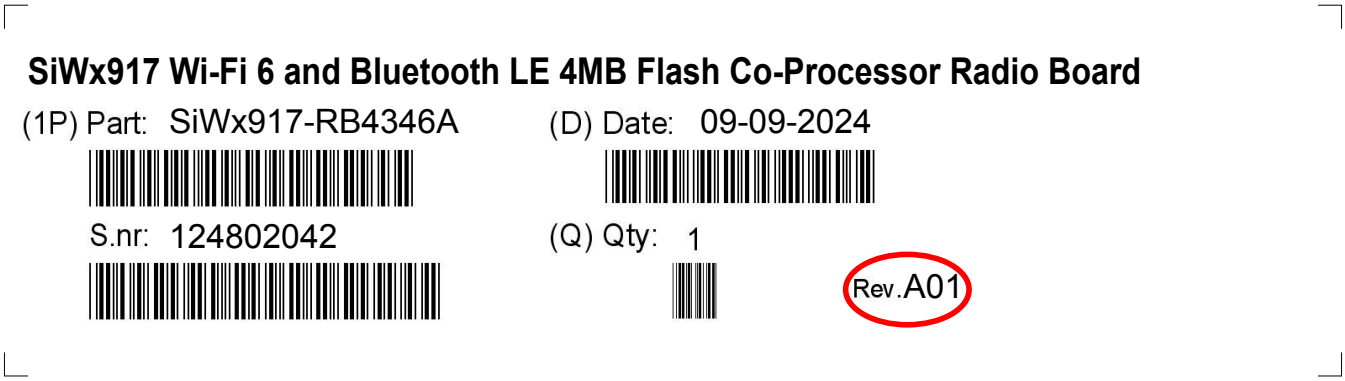


Figure 6.1. Kit Label

6.1 SiWx917-RB4346A Revision History

Kit Revision	Released	Description
A01	9 September 2024	Kit revised due to BRD4346A upped to A13.
A00	15 March 2024	Initial release.

6.2 SiWx917-EB4346A Revision History

Kit Revision	Released	Description
A00	31 October 2023	Initial release.

7. Document Revision History

Revision 1.10

September 2024

- Updated revision history and kit details.

Revision 1.0

February 2024

- Initial document release.

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